

# Equations

Honors Physics

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## Kinematics:

$$\bar{v} = \frac{\Delta \bar{x}}{\Delta t} \quad (1)$$

$$\bar{a} = \frac{\Delta \bar{v}}{\Delta t} \quad (2)$$

$$\Delta x = v_{ix}t + \frac{1}{2}a_xt^2 \quad (3)$$

$$v_{fx}^2 = v_{ix}^2 + 2a_x\Delta x \quad (4)$$

$$v_{fx} = v_{ix} + a_xt \quad (5)$$

## Forces:

$$\Sigma \bar{F} = m\bar{a} \quad (6)$$

$$F_f = \mu F_N \quad (7)$$

## Momentum:

$$\bar{p} = m\bar{v} \quad (8)$$

$$\bar{J} = \Delta \bar{p} \quad (9)$$

$$\bar{F}\Delta t = m\Delta \bar{v} \quad (10)$$

$$\bar{p}_{1i} + \bar{p}_{2i} = \bar{p}_{1f} + \bar{p}_{2f} \quad (11)$$

$$(m_1 + m_2)\bar{v}_i = \bar{p}_{1f} + \bar{p}_{2f} \quad (12)$$

$$\bar{p}_{1i} + \bar{p}_{2i} = (m_1 + m_2)\bar{v}_f \quad (13)$$

**Work, Energy, and Power:**

$$W = F d \cos\theta \quad (14)$$

$$W = \Delta E = (K_f - K_i) + (U_{gf} - U_{gi}) \quad (15)$$

$$K = \frac{1}{2}mv^2 \quad (16)$$

$$U_g = m a_g h \quad (17)$$

$$K_i + U_{gi} = K_f + U_{gf} \quad (18)$$